

COMPLETE SET OF PENDING CLAIMS

1. (Currently Amended). A method for processing a wafer workpiece, comprising the steps of:
 - spraying providing a liquid at a temperature in the range of about 25-150° C onto a surface of the wafer, with the liquid forming a liquid layer on the surface of the wafer workpiece;
 - introducing ozone into an environment containing the wafer workpiece at a rate of at least 90 grams per hour;
 - controlling a thickness of the liquid on the workpiece so as to form a liquid layer that allows for to allow diffusion of the ozone through the layer liquid layer to the surface of the wafer workpiece; and
 - with the ozone reacting the ozone at the surface of the wafer workpiece, to process the wafer workpiece.

2. (Currently Amended). A method for cleaning a surface of a wafer workpiece, comprising the steps of:

spraying providing a heated liquid solution of water and at least one of HF and HCl onto the surface of the wafer workpiece, with the heated liquid solution forming a liquid layer on the surface of the wafer, and with the heated

liquid solution assisting in maintaining the surface of the wafer workpiece at a temperature in the range of about 25-150° C;

introducing ozone into an environment containing the wafer workpiece at a rate of at least 90 grams per hour;

controlling a thickness of the heated liquid solution to form a thin liquid boundary layer on the surface of the workpiece to allow diffusion of the ozone through the layer of heated liquid solution, boundary layer for reaction at the surface of the wafer workpiece, to clean the wafer workpiece.

3. (Original) The method of claim 1 where the ozone is introduced at a rate of at least 130 grams per hour.

4. (Original) The method of claim 1 where the ozone is introduced at a flow rate of at least 10 lpm and a concentration of at least 10% by weight.

5. (Original) The method of claim 1 wherein the liquid comprises deionized water.

6. (Original) The method of claim 5 wherein the deionized water is superheated.

7. (Original) The method of claim 1 wherein the liquid includes sulfuric acid, hydrochloric acid, ammonium hydroxide, or deionized water.

8. (Currently Amended) The method of claim 1 wherein the step of controlling comprises the step of rotating the wafer workpiece.

9. (Currently Amended) The method of claim 1 wherein the step of controlling comprises the step of rotating the wafer workpiece at a rotation rate equal to or greater than about 300 rpm.

10. (Original) The method of claim 1 wherein the step of controlling comprises adding a surfactant to the liquid.

11. (Currently Amended) The method of claim 1 wherein the step of controlling comprises the step of spraying the liquid onto the surface of the wafer workpiece at a controlled flow rate.

12. (Original) The method of claim 1 wherein the liquid includes water and HF at a concentration ratio of between about 50: 1 and 500: 1.

13. (Original) The method of claim 1 wherein the liquid includes water and HCl at a concentration ratio of between about 50: 1 and 500: 1.
14. (Original) The method of claim 1 wherein the liquid includes water, HF and HCl at a concentration ratio of between about 50: 1: 1 and 500: 1: 1.
15. (Cancelled).
16. (Cancelled).
17. (Previously Presented) The system of claim 27 with the ozone supply system comprising a contactor for receiving the ozone and the liquid.
18. (Cancelled).
19. (Currently Amended) The system of claim 27 further comprising a rotor assembly in the chamber for rotating the wafer workpiece.
20. (Previously Presented) The system of claim 27 where the ozone supply system generates a flow of ozone at a flow rate of at least 10 lpm and a concentration of at least 10% by weight.
21. (Previously Presented) The system of claim 27 where the heater comprises a steam boiler.
22. (Cancelled).

23. (Currently Amended) The system of claim 27 further comprising with the means for controlling a thickness of a liquid layer on the wafer workpiece, including at least one of:

a rotor for rotating the wafer workpiece;

a fluid flow controller or one or more nozzles adapted to generate fine droplets of the liquid.

24. (Cancelled).

25. (Cancelled).

26. (Currently Amended). A method for processing a wafer workpiece, comprising the steps of:

spraying providing an aqueous liquid boundary layer onto a surface of the wafer workpiece with the liquid boundary layer at a temperature in the range of 55-120° C, and with the aqueous liquid forming into a liquid boundary layer;

introducing ozone into an environment containing the wafer workpiece at a rate of at least 90 grams per hour;

controlling a thickness of the aqueous liquid boundary layer to allow for diffusion of the ozone through the boundary layer and a reaction at the surface of the wafer workpiece, to process the wafer workpiece.

27. (Currently Amended) A system for processing a workpiece, wafer comprising:

a process chamber;

means for spraying an aqueous liquid onto a surface of the wafer;

means for forming the aqueous liquid into a liquid boundary layer on the surface of the wafer workpiece;

an ozone supply system for providing ozone directly or indirectly into the chamber, and having a capacity of at least 90 grams per hour, whereby the ozone can diffuse through the liquid boundary layer to [a] the surface of the wafer workpiece;
and

a heater for heating the aqueous liquid to a temperature in the range of 25-150° C before the aqueous liquid is sprayed onto the surface of the wafer provided onto the workpiece.

28. (Cancelled).

29. (Cancelled).

30. (Cancelled).

31. (Previously Presented) The method of claim 1 wherein the liquid is at a temperature in the range of 55-120° C.

32. (Previously Presented) The method of claim 1 wherein the liquid is heated to a temperature in the range of 75-115° C.

33. (Previously Presented) The method of claim 27 wherein the liquid is heated to a temperature in the range of 75-115° C.

34. (Previously Presented) The method of claim 27 wherein the liquid is heated to a temperature in the range of 85-105° C.